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ABSTRACT

The four studies in this report consider the attribution of ability in the relationship of tutor to tutee among elementary level students. In each of the studies, the tutee displayed, or was represented as displaying, one of four learning sequences: success-success, failure-failure, failure-success, or success-failure. The results of the first study showed that the tutor attributed ability to the tutee in relation to the tutee's performance on the first part of a two-part lesson. The results of the second and third study, which were designed to eliminate the primacy effect, were similar to the results of the first. In the fourth study, tutors viewed a graphical representation of the tutee's performance on the first part of a concept formation learning task. In contrast to the typical finding of a strong primacy effect, the results of the fourth study showed a strong recency effect: the students' performance on the second half of the learning task was the major determinant of attribution of ability. Each report describes the methods, procedures, and results of the study in detail. (HMD)

Technical Report No. 281

FOUR STUDIES ON ATTRIBUTION OF ABILITY

by

Robert S. Feldman and Vernon L. Allen

Report from the Project on
Conditions of School Learning and
Instructional Strategies

Wisconsin Research and Development
Center for Cognitive Learning
The University of Wisconsin
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Statement of Focus

Individually Guided Education (IGE) is a new comprehensive system of elementary education. The following components of the IGE system are in varying stages of development and implementation: a new organization for instruction and related administrative arrangements; a model of instructional programing for the individual student; and curriculum components in prereading, reading, mathematics, motivation, and environmental education. The development of other curriculum components, of a system for managing instruction by computer, and of instructional strategies is needed to complete the system. Continuing programmatic research is required to provide a sound knowledge base for the components under development and for improved second generation components. Finally, systematic implementation is essential so that the products will function properly in the IGE schools.

The Center plans and carries out the research, development, and implementation components of its IGE program in this sequence: (1) identify the needs and delimit the component problem area; (2) assess the possible constraints—financial resources and availability of staff; (3) formulate general plans and specific procedures for solving the problems; (4) secure and allocate human and material resources to carry out the plans; (5) provide for effective communication among personnel and efficient management of activities and resources; and (6) evaluate the effectiveness of each activity and its contribution to the total program and correct any difficulties through feedback mechanisms and appropriate management techniques.

A self-renewing system of elementary education is projected in each participating elementary school, i.e., one which is less dependent on external sources for direction and is more responsive to the needs of the children attending each particular school. In the IGE schools, Center-developed and other curriculum products compatible with the Center's instructional programing model will lead to higher student achievement and self-direction in learning and in conduct and also to higher morale and job satisfaction among educational personnel. Each developmental product makes its unique contribution to IGE as it is implemented in the schools. The various research components add to the knowledge of Center practitioners, developers, and theorists.

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Study I
Tutor Attribution and Attitude as a Function of Tutee Performance[1]

Among the many innovations suggested for improving education in the public schools, there is one technique currently enjoying considerable popularity across the country—the use of older children to teach younger children (Gartner, Kohler & Riessman, 1971). It has been observed by teachers, and corroborated by research, that children who teach other children (tutors) appear to gain as much from the tutoring program as children being taught (tutees), both in terms of cognitive learning and in social-personal consequences such as increased self-esteem and motivation (Cloward, 1967; Lippitt & Lohman, 1965). In spite of the widespread existence of in-school programs utilizing children to tutor other children, only a small amount of empirical data is available. Unfortunately, existing research in this area suffers from being quite atheoretical and nonanalytical in its approach. As a result, we have little understanding of the basic psychological processes that mediate the positive consequences of tutoring for the tutee and the tutor.

The present experiment explores some determinants of the effect of tutoring on the tutor. More specifically, the experiment deals with the effect of the tutee's performance on the tutor's attitudes and attributions toward the tutee and toward his own performance as a tutor. We are concerned in particular with how the tutee's pattern of success and failure on the learning task influences the attitudes and attributions made by the tutor about the tutee and about the experience of teaching.

Both reinforcement theory and role theory suggest that the degree of student success over a period of time will affect the tutor's perception of the student's ability and his liking for the student. Thus, a student who does consistently well should be perceived as more intelligent and likeable than one who does consistently poorly. Likewise, a tutor should like the teaching experience more when his student does consistently well than when he does consistently poorly. These predictions are straightforward and not surprising.

Role theory suggests further, however, that the order, or *sequence*, of a tutee's success or failure over a period of time is a critical determinant of the tutor's perceptions. The impact of tutoring on the tutor should be affected by his perceived success in enacting the teacher role (i.e., by his success in actually helping his tutee) in much the same way that changes in self in a direction consistent with role expectations are produced by successful enactment of any social role (Sarbin & Allen, 1968).

In the tutoring situation, it is congruent with the role of teacher for a student to do poorly on a task initially but later to show improvement in his performance; that is, the teacher's efforts are supposed to help the student improve his learning. Thus, the tutor should perceive his enactment of the role of teacher as appropriate and effective, if the student shows an improvement in performance over time. In the converse of this pattern of performance, namely, the student initially doing well but then deteriorating in performance over time, the tutor should perceive his enactment of the role of teacher as ineffective and inappropriate. Therefore, with an equivalent amount of objectively successful learning, the direction of change in the tutee's

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[1]Portions of this study were presented at the annual convention of the American Psychological Association, Honolulu, 1972.

performance should determine the tutor's satisfaction with his role enactment.

In the present study, the tutor's attitudes toward the tutee and attributions of ability about the tutee were investigated as a function of the pattern of the tutee's performance. The pattern, or sequence, of performance of a learner in the tutor-tutee learning situation was varied according to degree of congruence of the learning to expectations of the teacher role. Over a one-session teaching period the tutee's performance varied according to one of four patterns: success throughout the session, failure throughout, success in the first half and failure in the second half, or failure in the first half and success in the second half. For conditions of changing performance by the tutee (success-failure, failure-success) the absolute level of performance was identical; only the sequence of the success and failure differed across the two conditions. It was thought that in the learning situation most closely approximating expectations of the teacher role, the teacher should respond more positively about his own performance and also express more positive attitudes and attributions about the learner.

Method

Tutors

Eighty-one sixth-grade children (39 males and 42 females) from local public schools served as tutors. Subjects were recruited from a randomly selected sample of public school children. A letter was sent offering them $2.00 for participating in the experiment. Two males were omitted from the data analysis for not following instructions regarding the method of teaching, leaving a total of 79 subjects.

Tutees

The experimental manipulations required that each tutor experience a specified sequence of success and failure responses from his tutee. Therefore, the tutees were not actually naive younger children but confederates of the experimenter trained to answer each tutor in a standard manner according to experimental condition. Two younger third-grade children, one boy and one girl, were used throughout the experiment to play the role of tutee.

Procedure

The experiment was divided into two sessions occurring one week apart. Subjects (tutors) were given instructions on the concept-formation task at the first session and taught the concept to a younger child of the same sex at the second session.

At the first session subjects were taught the concept of *trapezoid* as a group in a session lasting approximately 45 minutes. Experienced elementary school teachers taught the concept. Subjects received instructions on three simple rules for identifying an instance of a trapezoid: (1) trapezoids have *only* four sides; (2) two opposite sides are parallel, which means that they never meet if they are made longer; and (3) two opposite sides are not parallel, which means that they do meet if they are made longer. At the end of the first session the "Trapezoid Concept Attainment Test" (Cicirelli, 1971) was administered to the subjects to ensure that they understood the concept of *trapezoid*. The test was composed of 30 geometric figures—15 examples and 15 nonexamples of trapezoids randomly interspersed across the series. Subjects were required to state whether or not each figure was a trapezoid. Each subject's score was determined by the number of positive and negative instances he identified correctly.

Approximately one week after the first session subjects returned individually for a second 45-minute session to teach the concept of *trapezoid* to a same-sex confederate serving as the tutee. Subjects were given specially prepared booklets entitled "Trapezoids," which they used in teaching the tutee. On the first page of the booklet were the three rules for trapezoids, and on the following page were three examples of a trapezoid. The remainder of the booklet contained a trapezoid test composed of 24 geometric figures taken from the "Trapezoid Concept Attainment Test." Twelve of the figures were examples of a trapezoid and 12 were nonexamples. The tutor's booklet, subtitled, "Teacher's Answer Book," had the answers to the 24 test questions.

Before meeting with his tutee, each subject was given explicit instructions on how to teach the trapezoid concept. Tutors were told to explain the three rules of trapezoid identification and then to explain why the three examples were trapezoids. Subjects were given the following instructions concerning the trapezoid test:

> For each page, read the number and the question, "Is this a trapezoid?" Tell your student if he is right or wrong. If your student is wrong, tell him the right answer and why he was wrong. When you have done 12 of the questions, go over the three rules for trapezoids at the beginning of the book again and show him the examples. Then begin the test at Question 13.

Thus, the tutors were told to review the rules for trapezoid identification midway in the test and then to complete the other 12 items of the test with their tutee. Tutors were told further that the test was to be given orally and were asked to ensure that the tutee could not see the answers in the "Teacher's Answer Book."

Subjects were then introduced to the tutee (confederate) for the actual teaching session. The tutor and tutee were left alone in a small room and told that the experimenter would wait outside until the teaching session was completed.

Experimental Manipulations

A 2 x 2 x 2 factorial analysis of variance design was used. The three factors were tutee's first-half answers (success or failure), tutee's second-half answers (success or failure), and sex of subject. Subjects were assigned randomly to one of the following four conditions in which the number and sequence of correct answers that the confederate gave on the concept-formation task were experimentally manipulated:

1. *Success-success.* In this condition, the confederate performed well on both the first and second halves of the 24-item test. To provide verisimilitude, the confederate answered incorrectly on six trials (25%) distributed evenly across the test. The remaining 18 items (75%) were answered correctly.
2. *Failure-failure.* The confederate gave the wrong answer on 75% of the trials in this condition, answering correctly only six times. This condition is the converse of the success-success condition: the confederate gave correct answers only on those items answered erroneously in the success-success condition. On the 18 remaining questions, the confederate either gave the wrong answer or said he didn't know the answer.
3. *Failure-success.* In this condition, the confederate did poorly during the first half of the test but then answered correctly during the second half. The tutee's responses were the same as answers in the first half of the failure-failure condition and the second half of the success-success condition.
4. *Success-failure.* This condition is the converse of the failure-success condition. The confederate did well on the 12 trials in the first half of the test and poorly on the 12 trials in the second half. The tutee's behavior was the same as in the first half of the success-success condition and the second half of the failure-failure condition.

To aid the confederate in giving the required sequence of answers, the "Trapezoids" booklet he was given was specially prepared for the experimental condition. The tutee's predetermined answer for each trial was indicated to him by a light mark on his booklet.

Dependent Measures and Method of Analysis

Upon conclusion of the teaching session, the experimenter, who was not aware of the tutor's experimental condition, gave the tutor a questionnaire. The questionnaire was designed to ascertain the tutor's responses in the following areas: (1) perception of ability and success of the tutee, (2) attitude toward the tutee and toward the teaching session, (3) estimate of his own ability and success as a teacher, (4) attributions of locus of causality for tutee's performance, and (5) general attitudes toward teaching. A sample item was used to familiarize the subject with the 7-point Likert scales used for most questions. The experimenter read each item aloud to the subject, who wrote his answers on his copy of the questionnaire.

Following completion of the questionnaire, the subjects were paid. Because the subjects were so young they were not told that a confederate had been used. All subjects were encouraged to express how they felt about the teaching experience and were given assurances that they had performed successfully in the experiment.

Items with 7-point Likert scales were analyzed using analyses of variance. Three orthogonal factors, each having two levels, were used in the analyses: tutee's first-

half learning (success or failure), tutee's second-half learning (success or failure), and sex of subject. The first-half learning main effect reveals whether the tutee's initial first-half performance (success or failure) resulted in a significant effect on the dependent measure. To test for that effect, the conditions in which the subject was successful in the first half (success-success and success-failure conditions) were compared to the conditions in which the subject performed poorly in the first half (failure-success and failure-failure conditions). Likewise, the main effect for second-half performance was tested by comparing conditions in which the subject performed well in the second half (success-success and failure-success conditions) to conditions in which the subject performed poorly in the second half (success-failure and failure-failure conditions). By using this method of analysis, it was possible to determine the relative influence of first-half and second-half performance by tutees on the attitudes and attributions of tutors at the conclusion of the tutoring session.

Results

Tutor's Reactions Toward Tutee

First, we shall examine the tutor's reactions toward his student and toward the teaching situation as a function of degree of success and pattern of responses exhibited by the tutee. At the completion of the teaching session, the tutor's reactions were obtained from questions evaluating the tutee in the areas of interpersonal attraction, intellectual ability, and perceived performance.

Liking. On one item the tutor was asked, "How much did you like your student?" Analysis of variance showed a significant main effect for first-half learning only ($F = 3.82$, $p < .05$) and no interactions. As can be seen from the means in the first column of Table I.1, the tutor's liking for the tutee was affected by the tutee's performance in the first half of the session. As might be expected, the tutor liked the tutee better when he had performed well in the first half than when he had performed poorly. But the tutee's success or failure during the second half of the session did not differentially affect the tutor's liking for him. In short, a strong primacy effect was evident: the tutee's performance in the initial phase of the session produced a differential effect on liking, but the tutee's performance during the second half of the session did not. The primacy effect can be seen very clearly in the first column in the bottom half of Table I.1 where, for clarity of presentation, the data are combined according to success or failure during each half of the session.

First-half performance was also the only significant determinant of subjects' responses to the item, "How much did you enjoy teaching your student?" Subjects enjoyed teaching more when their students performed well in the beginning of the session than when they were unsuccessful ($F = 5.47$, $p < .02$), regardless of subsequent success or failure in second-half behavior. These data are shown in column 2 of Table I.1.

The item, "How much do you think your student enjoyed being taught by you?" showed the same primacy effect. A main effect for first-half learning ($F = 7.65$, $p < .007$) was the only significant source of variance on the item. An examination of the means shown in Table I.1 (column 3) reveals that subjects whose tutee performed well during the first half of the teaching session attributed greater enjoyment of the session to their tutee than subjects whose tutee had done poorly in the first half. Again, second-half performance of the tutee did not affect the attributions made by tutors.

Ability. Attribution made by the tutor concerning the tutee's ability was assessed by the question, "How smart was your student?" This item resulted in both a first-half main effect ($F = 16.50$, $p < .001$) and a second-half main effect ($F = 7.55$, $p < .007$) but no sex main effect or interactions. Hays' (1963) formula to find the *strength* of an effect was applied; the first-half main effect was clearly stronger than the second-half effect, accounting for twice as much variance (16% versus 8%) on the item. The condition means appearing in the fourth column of Table I.1 support the earlier findings of a primacy effect: success in the first half resulted in attributions of significantly greater ability than failure in the first half, with second-half behavior having a somewhat weaker effect on tutor's attributions.

Perception of tutee's performance. The item "How well did your student do?" was included in order to obtain the tutor's subjective estimate of his tutee's performance during the teaching session. Significant main effects were found for both first-half learning ($F = 15.72$, $p < .002$) and second-half learning ($F = 12.30$, $p < .008$). There was no sex effect, nor were there any interactions. Column 5 in Table I.1 shows that tutees in the success-success and success-failure conditions were judged by the tutors to have

Table I.1

Mean Scores for Tutors' Responses[a]

Condition	N	Responses About Self: Liking of Tutee	Responses About Self: Enjoyment of Tutoring	Responses About Tutee: Enjoyment	Responses About Tutee: Intelligence	Responses About Tutee: Overall Performance
Success-success	20	6.35	6.85	5.15	5.85	6.25
Success-failure	20	6.25	6.65	5.45	5.50	5.35
Failure-success	20	5.70	6.10	4.25	5.20	5.20
Failure-failure	19	5.79	6.42	4.63	4.32	4.00
First-half success		6.30	6.75	5.30	5.68	5.80
First-half failure		5.74	6.26	4.44	4.77	4.62
Second-half success		6.03	6.48	4.70	5.53	5.73
Second-half failure		6.03	6.54	5.05	4.93	4.69

[a]High scores indicate more positive responses on a 7-point scale.

Table I.2

Tutors' Perception of Sequence of Tutee Performance (Percent)

Perceived Condition	Actual Experimental Condition: Success-Success	Success-Failure	Failure-Success	Failure-Failure
Success-success	80[a]	55	30	11
Success-failure	0	0[a]	0	16
Failure-success	20	30	10[a]	26
Failure-failure	0	15	60	47[a]
	(100)	(100)	(100)	(100)

[a]Accurate report.

done better than those in the failure-success and failure-failure conditions. Consistent with our other results, first-half performance appeared to be somewhat more influential in determining the tutor's perception of the tutee than second-half performance. A test of the strength of the first- and second-half main effects by Hays' (1963) formula showed that first-half performance accounted for only slightly greater variance (16%) than second-half performance (13%).

As another index of tutor's perceptions of their tutees' performance, tutors were asked explicitly which of four descriptions of performance applied to their tutee: (1) performed well throughout both halves of the lesson, (2) performed poorly throughout both halves of the lesson, (3) did well in the first half and poorly in the second half of the lesson, or (4) did poorly in the first half and well in the second half of the lesson. As shown in Table I.2, subjects differentially perceived the correct sequence and degree of performance of their tutee according to experimental condition ($\chi^2 = 38.84$, $p < .01$). Subjects in the success-success and failure-failure conditions were relatively accurate in estimating their tutee's performance, though subjects in the former condition were considerably more accurate than subjects in the latter (80% and 47%, respectively). By contrast, correct identification of the tutee's experimental condition was attained by only two tutors in the failure-success condition and by no one at all in the success-failure condition. The majority of subjects in the failure-success condition erroneously thought the tutee did poorly throughout the session (60%), and in the

Table I.3

Mean Scores for Tutor's Evaluation of His Teaching

Condition	N	Teaching Performance[a]	Locus of Causality[b]
Success-success	20	4.90	3.05
Success-failure	20	5.05	3.45
Failure-success	20	4.95	4.00
Failure-failure	19	4.42	3.79
First-half success		4.98	3.25
First-half failure		4.69	3.90
Second-half success		4.93	3.53
Second-half failure		4.74	3.62

[a] High scores indicate more positive responses on a 7-point scale.
[b] A scale score of 7 indicates the tutor was the more important determinant of tutee preference; a score of 1 indicates tutee was more important.

success-failure condition most subjects incorrectly perceived the tutee as being successful throughout the lesson (55%). Thus, tutors' perception of second-half performance of tutees was distorted in a direction congruent with the first-half objective performance.

Tutor's Evaluation of His Teaching

In contrast to results for items dealing with the tutor's reactions to the tutee, no consistent pattern emerged concerning the tutor's evaluation of his own performance as a teacher. On the item, "How well did you do as a teacher?" there were no significant differences across conditions, as can be seen in Table I.3. This is somewhat surprising since the performance of the tutees did vary greatly across conditions. In all conditions the mean score for the tutor's evaluation of his teaching was somewhat positive (approximately 5 on the scale, with 7 indicating "very well").

One item was designed to ascertain the tutor's perception of the major determinant of his tutee's performance—the tutor's skill as a teacher or the tutee's intellectual ability. Results showed that the first- and second-half main effects were not significant, but there was a main effect for sex ($F = 4.10$, $p < .05$); a first-half x second-half x sex interaction ($F = 3.64$, $p < .05$) was also present. In general, female tutors claimed more responsibility for the tutee's performance than males. Inspection of the interaction showed that female tutors tended to attribute consistent tutee performance (success-success, failure-failure) to themselves and inconsistent performance (success-failure, failure-success) to the tutee; male tutors showed the opposite pattern. The interaction results are quite complex and not easy to interpret.

In summary, it appears that sequence of the tutee's performance on a learning task had significant effects on the tutor's attributions and attitudes about the tutee but little systematic impact on the tutor's perceptions and attributions regarding his own behavior.

Discussion

Results of the present experiment showed clearly that the sequence of the tutee's success or failure on a concept-formation task, rather than the absolute amount of learning per se, determined the tutor's attitudes and attributions about the tutee and about the tutoring experience. A strong and consistent primacy effect was found: the tutee's initial performance exerted a stronger impact than later performance on several aspects of the tutor's reactions toward the tutee, including liking, perception of amount learned, and attribution of ability. The same primacy effect was also obtained for the tutor's own enjoyment of the tutoring session.

The primacy result obtained in the present study is in accord with data from a recent series of studies conducted by Jones and Goethals (1971) on the attribution of ability. In several studies they obtained a strong primacy effect when an observer made attributions of ability about a person solving a

series of problems of homogeneous difficulty. Current explanations of the primacy effect are essentially descriptive statements of the observed phenomenon; the underlying psychological processes are not yet clearly understood. Our data on recall are consistent with the hypothesis of Jones and Goethals that later information is assimilated to an initial expectation. In recalling the sequence of tutee's performance, tutors tended to distort later performance (second-half) toward the direction of earlier performance (first-half). Thus, for example, the failure-success sequence was more often interpreted by tutors as failure-failure. Through memory distortion, later information was assimilated toward the expectation established by the tutee's initial performance.

In the present study we obtained the primacy effect across a broad spectrum of responses—attribution of ability, perceptions of performance, liking of the tutee, and enjoyment of tutoring. The primacy effect is clearly not restricted to areas of behavior in which a stable disposition (such as ability) can be assumed. In previous studies the primacy effect has been observed for ability (Jones, Rock, Shaver, Goethals, & Ward, 1968) and for affect or liking (Mettee, 1971). But in our study we obtained the primacy effect simultaneously in two areas, cognitive and affective (liking, tutor's enjoyment, and perceived tutee enjoyment).

Performance was the sole aspect of the tutee's behavior that varied across experimental conditions; hence, affective responses could have resulted only from the tutee's performance (or more precisely, from perception of the performance). All the potential causal paths for the origins of affective responses are depicted in Table I.4. (We do not think it is reasonable to assume the reverse causal sequence from the basic path shown in Table I.4, viz., that affective responses precede attribution of ability.) Although all the relations shown are logically possible, we do not believe that all are equally likely to occur in reality. The first three causal paths in Table I.4 are, we think, the most reasonable possibilities. Thus, we assume that it is most likely that affective reactions are either (1) direct sequelae of the tutee's performance, (2) indirect consequences mediated through attribution of ability, or (3) indirect effects brought about through the joint mediation of attribution of ability and liking for tutee.

Interestingly, neither the order of the tutee's performance nor the absolute amount of tutee success or failure affected the tutor's evaluation of himself in the role of teacher. Perhaps subjects were simply reluctant to state publicly the obvious fact, viz., that in some cases they apparently had not performed well as a tutor. A more plausible interpretation can be offered, however. Our subjects tended to feel that their performance as a teacher had little influence on their tutee's level of learning. On a question asking for the most important reason for the tutee's performance, means for three of the conditions fell toward the end of the scale indicating as the reason, "how smart a learner he was." The condition that should have created greater feelings of teacher responsibility (failure-success) had a mean score exactly in the midpoint of the learner-teacher causality scale. It appears, then, that our tutors simply perceived the locus of causality for amount of learning as not residing primarily in themselves. Remember that our tutors were sixth graders, whereas adults have been employed in previous studies. With college subjects as teachers, stronger attributions of teacher responsibility in learning situations do occur (Beckman, 1970; Johnson, Feigenbaum, & Weiby, 1964). Since tutors in the present study felt little responsibility for the tutee's performance, regardless of how well or how poorly the tutee did (or whatever the sequence of the learning), it had little influence on the tutor's evaluation of his performance as a teacher.

It should be noted that the tutoring situation used in the present study differs in several important ways from the experimental situation used in most of the studies of Jones and his colleagues and in other studies that have found the primacy effect. First of all, our subjects were not merely observing another person's behavior; they were actively involved as teachers of younger children. A tutor has, of course, some personal stake in the learner's doing well on the learning task. Other research (Beckman, 1970; Johnson et al., 1964) has found self-enhancement by the teacher to occur in evaluation of student behavior; this source of distortion is not present when the subject merely observes another's behavior. Self-enhancement of attributions about the learner should operate to mitigate the primacy effect in the success-failure condition. Secondly, our subjects were young children (sixth graders) reporting their impressions about the behavior of even younger children (third graders). Other studies have typically used college students as subjects observing the behavior of persons of the same age. In the case of young children, problems in attention, initial learning, and recall might be expected to reduce the primacy effect. For example, if young children were less adept than older subjects in recalling earlier information, one

Table I.4

Possible Causal Paths Between Tutor's Attribution of Ability and Affective Responses

1.	Objective Performance	→ Perceived Performance	→ Ability Attribution Liking for Tutee Enjoyment of Tutoring Tutee Enjoyment of Lesson			
2.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Liking for Tutee Enjoyment of Tutoring Tutee Enjoyment of Lesson		
3.	Objective Performance	→ Perceived Performance	→ Ability Attribution Liking for Tutee	→ Enjoyment of Tutoring Tutee Enjoyment of Lesson		
4.	Objective Performance	→ Perceived Performance	→ Ability Attribution Enjoyment of Tutoring	→ Liking for Tutee Tutee Enjoyment of Lesson		
5.	Objective Performance	→ Perceived Performance	→ Ability Attribution Tutee Enjoyment of Lesson	→ Liking for Tutee Enjoyment of Tutoring		
6.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Liking for Tutee	→ Enjoyment of Tutoring	→ Tutee Enjoyment of Lesson
7.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Liking for Tutee	→ Tutee Enjoyment of Lesson	→ Enjoyment of Tutoring
8.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Enjoyment of Tutoring	→ Liking for Tutee	→ Tutee Enjoyment of Lesson
9.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Enjoyment of Tutoring	→ Tutee Enjoyment of Lesson	→ Liking for Tutee
10.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Tutee Enjoyment of Lesson	→ Liking for Tutee	→ Enjoyment of Tutoring
11.	Objective Performance	→ Perceived Performance	→ Ability Attribution	→ Tutee Enjoyment of Lesson	→ Enjoyment of Tutoring	→ Liking for Tutee

would expect a recency instead of a primacy effect. All these conditions should operate in the direction of obliterating the primacy effect in the present study. The occurrence of a strong primacy effect on both ability attributions and affective responses in the face of adverse circumstances demonstrates the generality and the robustness of the phenomenon.

Let us now return to the basic question with which we began this experiment: How does the tutee's performance affect the tutor? First of all, as predicted, the tutor's attributions and attitudes concerning the tutee are not simply a matter of the tutee's absolute amount of learning regardless of the sequence, as would be predicted by a simple version of reinforcement theory. Contrary to our prediction, however, the condition that more closely approximated the role of teacher (initial poor learning followed by improvement) did not result in more positive responses by the tutor. Instead, the tutor's attribution of ability, liking of the tutee, and general reactions to the tutoring situation were disproportionately influenced by the level of performance exhibited by the tutee early in the session. In conditions with the same absolute level of learning, the first half of the session had greater influence on the tutor's reactions than the second half.

Would the initial performance of the tutee still exert a disproportionate influence on the tutor's reactions even if the successful and unsuccessful learning were separated by the interval of a few days? Many actual tutoring programs in the schools are arranged on a schedule of two or three meetings a week. The temporal separation might be sufficient to destroy the initial expectation established by the tutor. In another study (Study III), we did separate the two parts of the lesson by an interval of two days. Results still disclosed a clear primacy effect, attesting to the strength and persistence of the tutor's initial expectations about the tutee.

Implications of present results for the practical situation of cross-age tutoring in the schools are obvious. According to our results, it is important that the first learning task be easy enough to ensure that the tutee exhibits a high level of performance at the initial stage of the tutoring session. Initial performance will affect the tutor's attribution about the tutee's ability, liking of the tutee, and the tutor's own enjoyment of tutoring. And the tutor's expectations about the tutee, as indicated from other research (Rosenthal & Jacobson, 1968; Rubovits & Maehr, 1971), may indeed influence the tutee's subsequent learning. Moreover, the nature of the tutor's initial reactions to the tutoring situation may determine how much he will benefit from the potentially useful experience of teaching a younger child.

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Study II
On the Importance of First Impressions: Attribution of Ability and the Primacy Effect

Recent experimental evidence has shown that there is a stable and powerful primacy effect in attribution of ability: early information about a stimulus person's performance has a greater impact than later information (Study I; Jones & Goethals, 1971). The finding of a primacy effect is congruent with more general research on impression formation (Anderson, 1965; Asch, 1946). In Asch's paradigm, subjects are presented with a list of adjectives describing a hypothetical person. Asch (1946) found that words early in the list have more influence than those that appear later. According to Asch, subjects reinterpret the meaning of adjectives later in the list in terms of the first adjectives they receive, forming an overall "Gestalt." Anderson (1965) interpreted the primacy effect in terms of a weighted-averaging model of information integration. He suggested that the meaning of words in a list remains constant, but the weight given to each word by the subject decreases for words nearer the end of the list. Although there is evidence to support a weighted-averaging process, no explanation for the effect has been presented.

As Jones and Davis (1965) have pointed out, the use of lists of adjectives to describe persons, as in the work of Anderson and Asch, must be considered a somewhat static procedure that does not approximate the real-life attributional process in which dispositions are inferred from behavior. In addition, these investigators did not vary different levels or strengths of a *single* disposition (such as high versus low friendliness); instead, they presented subjects with lists composed of independent dispositions. Thus, a person might be described as cold, intelligent, and hard-working—all very different dispositional characteristics which the subject must integrate. It is difficult, therefore, to extrapolate directly from the type of procedure used in the research of Asch and Anderson to the problem of attribution of ability.

The most extensive work in ability attribution in behavioral situations has been carried out by Jones and his colleagues (Jones, Goethals, Kennington, & Severance, 1972; Jones, Rock, Shaver, Goethals, & Ward, 1968). In a number of experiments, subjects observed a stimulus person who attempted to solve a series of problems supposedly indicative of intellectual ability. The stimulus person (a confederate of the experimenter) showed a pattern of either ascending or descending success over the trials; the overall number of correct answers was the same in both patterns. In this situation, a primacy effect emerged consistently: the learner was seen as being significantly more intelligent and successful when he displayed success on initial trials (and then declined in performance) than when he was initially unsuccessful (and then increased in performance). The primacy effect occurred even though the number of objectively correct answers was the same in both the ascending and descending sequence.

Subsequent evidence has confirmed the generality of the finding of a primacy effect in ability attributions. For instance, we found that sixth-grade children attributed greater success and ability to a third grader when he initially performed well than when he initially performed poorly—regardless of subsequent success or failure in the lesson (Study I). Although in a few instances primacy effects in ability attributions have not been found (Jones & Welsh, 1971; Thompson, 1972), these instances occurred when subjects observed or participated in game-playing situations with somewhat unique characteristics. In general,

though, a primacy effect in attributions of ability has been found.

Jones et al. (1972) suggest that the primacy effect is due to a social judgment process in which early success or failure acts as an anchor, or expectation, and later performance is assimilated to the initial expectation. This hypothesis is based on the assumption that persons consider ability to be a stable disposition. After an initial expectation of success is established, variations in performance are perceived by subjects as being closer to the initial anchor than is objectively true because of assimilation to the anchor. To support this hypothesis, Jones et al. (1972) presented experimental evidence showing that subjects do in fact distort recall in favor of early occurrences when a "stable entity" such as ability is assumed.

If an assimilation process is the major determinant of the primacy effect, then separation of the behavior sequence into discrete segments should reduce or eliminate the effect. It is unlikely that the primacy effect will occur across situations that are divided into cognitively discrete units of behavior since a unit that is perceived as being truly different should produce a new anchor point to which subsequent behavior will be compared and assimilated. Thus, when an observer perceives a differentiation between early and later behavior, a new anchor point should develop. Establishing a new anchor point should result in either an elimination of the primacy effect in ability attributions or, in extreme cases, in a recency effect.

Indirect support for the hypothesis that primacy effects can be eliminated when two segments of behavior are somehow differentiated comes from a number of studies. Thibaut and Ross (1969), for instance, found that assimilation effects did not occur when subjects were not forced to make an early commitment to a particular level of ability. Likewise, the psychophysical literature shows that making repeated successive judgments of physical stimuli typically results in contrast effects—not assimilation (Postman & Miller, 1945). It may be inferred that making repeated judgments acts to differentiate behavior being performed into discrete units and, as a consequence, encourages the emergence of a new anchor. It is possible, then, that anything that would differentiate an ongoing behavior into segments would result in elimination of primacy effects based on early expectations. Thus, the primacy effect in ability attributions should be a function of the change in performance that happens at a point in time that clearly divides the performance sequence into discrete segments.

The present experiment directly tests this proposition. Subjects observed a two-part lesson between a tutor and a tutee. The tutee performed either consistently well, consistently poorly, started well in the first part and then did poorly in the second part, or did poorly and then well. Half the subjects received a manipulation designed to break the two parts of the lesson into discrete behavioral units and thus reduce tendencies to assimilate to the first expectation. The other subjects were told that the two parts of the lesson occurred without a separation between them. It was expected that attributions of ability assessed after an alleged or actual separation would not show a primacy effect, while a primacy effect was predicted for subjects who were told the lesson was uninterrupted.

Method

Subjects

Subjects were 57 males and 49 females in the fifth and sixth grades. Six of these subjects were omitted from the data analysis for failure to recall the alleged time difference between the two parts of the tutoring lesson they observed.

Procedure

Subjects were told that we were interested in finding the best way to plan tutoring programs in elementary school. They were instructed to watch one tutor-tutee pair on video tape and then to answer some questions about what they saw.

Subjects were shown a 15-minute videotaped sequence of a tutoring lesson with a sixth grader tutoring a third grader. Each teaching sequence began with the older child tutoring the younger child in a method of identifying trapezoids and parallelograms. Following this brief lesson, the tutor was shown administering two sets of exercises to the tutee. The tutee was presented a series of 12 figures in each set of exercises and was asked to identify whether each figure was a trapezoid, a parallelogram, or neither.

Male subjects observed a tape of a male tutor-tutee pair; females viewed a female dyad. Subjects observed the video tape in classrooms in groups of five to eight same-sex children. Previous research has shown that observation of a dyad results in attributions of ability equivalent to those made by actual participants in the situation (Jones et al., 1971); thus, the present method of observa-

tion has the advantages of greater control and economy with no loss of sensitivity.

Experimental Manipulations

The children in the video tape were actually paid confederates. This made it possible to control the apparent degree and pattern of learning. Experimental manipulations consisted of varying orthogonally the first-part performance (success or failure), second-part performance (success or failure), and alleged amount of elapsed time between the first and second parts (either none or two days).

First-part performance and second-part performance were combined factorially to form the following four sequences; only one sequence was shown to each subject.

1. *Success-success.* In this condition, the tutee performed well in both the first and second sets of exercises. The tutee answered correctly on 75% of the questions and, to provide verisimilitude, erroneously on 25% of the questions. The incorrect answers were randomly interspersed among the correct responses.
2. *Failure-failure.* This condition is the converse of the success-success condition: the tutee answered 75% of the questions incorrectly on both sets of exercises.
3. *Failure-success.* In this condition, the tutee performed poorly in the first set of exercises (identical to performance in the first part of the failure-failure condition) and successfully in the second set of exercises (as in the second part of the success-success condition).
4. *Success-failure.* In this condition, the tutee answered correctly 75% of the time in the first set of exercises and incorrectly 75% of the time in the second set. Performance was identical to that in the first part of the success-success and second part of the failure-failure conditions.

The manipulation of the alleged amount of time elapsed between the two parts of the exercises occurred after the subjects had viewed the first part. Subjects were told either that the two parts had actually occurred contiguously or that there was a two-day period of time between them. The statement of time separation was repeatedly and carefully stressed to the subjects prior to their viewing the second sets of exercises. Only a few minutes elapsed between viewing of the lesson parts.

Dependent Measures and Method of Analysis

After subjects had viewed both parts of the lesson, the experimenter administered a number of questions with 7-point Likert scales and some forced-choice questions designed to assess the subjects' perceptions of tutee performance. Subjects were asked how well the tutee did, for attributions of ability and learning, and for their perception of the locus of causality for the tutee's performance. Data from each Likert scale were analyzed in a 2 x 2 x 2 x 2 analysis of variance. The four factors were tutee's performance on the first part of the lesson (success or failure), tutee's performance on the second part of the lesson (success or failure), alleged time between the two parts of the lesson (none or two days), and sex of subject.

Results

Attribution of Ability

One item asked subjects for their estimate of the tutee's intelligence. It was expected that there would be an effect for the alleged time between lesson parts, with only those subjects who were told the two parts were contiguous showing the primacy effect. Results of an analysis of variance showed significant effects for first-part performance ($F = 19.81$, $p < .001$) and for second-part performance ($F = 11.87$, $p < .001$), but there was no effect for alleged time between lesson parts or sex of subject. No interactions were significant.

Examination of the mean scores for this item, shown in the first column of Table II.1, reveals that successful performance in each half led to attribution of greater intelligence than unsuccessful performance. However, estimates of the *magnitudes* of the first- and second-part effects, calculated using Hays' (1963) formula, revealed that first-part performance was somewhat more influential in determining the final attribution than second-part performance. First-part performance accounted for 16% of the variance, while second-part performance accounted for 10% of the variance. Thus, there was a slight primacy effect for ability attributions for all subjects, despite some subjects' belief that there was a temporal separation between the two parts of the lesson.

Table II.1

Mean Scores for Perception of Tutee Performance[a]

Condition	Tutee			
	Intelligence	Overall Performance	How Much Learned	Locus of Causality[b]
Success-success	5.03	5.38	5.77	4.69
Success-failure	4.54	4.18	4.86	3.71
Failure-success	4.38	4.00	5.81	4.42
Failure-failure	3.48	2.56	3.04	3.84
First-half success	4.78	4.76	5.30	4.18
First-half failure	3.89	3.20	4.30	4.09
Second-half success	4.78	4.74	5.79	4.58
Second-half failure	4.04	3.42	4.00	3.77

[a]Higher numbers indicate more positive responses on a 7-point scale.
[b]Higher numbers indicate locus is toward tutee.

Perception of Performance

A more general question, "Overall, how well did the student do on both sets of exercises?" was designed to assess subjects' perceptions of the tutee's performance. This item, measured with a 7-point Likert scale, was analyzed by analysis of variance. As on the previous item, we expected an effect for the alleged time between lesson parts, with only those subjects who were told that the lesson parts were contiguous showing a primacy effect. Results on this item also showed that the main effect for time between lesson parts was not significant. No interactions were significant. There were significant main effects for both first-half performance (F = 78.12, $p < .001$) and second-half performance (F = 35.55, $p < .001$).

Examination of the mean scores (Table II.1, column 2) shows that for both first- and second-half performance, tutees were seen as being more successful when they performed well than when they performed poorly. But first-part performance was a more important determinant of subjects' perception of success. Estimates of the magnitudes of the effects (Hays, 1963) showed that first-part performance accounted for a greater proportion of variance (41%) than did second-part performance (23%), indicating that a primacy effect had occurred. It appears, then, that a reported temporal separation between lesson parts had no effect on subjects' perceptions of how well the tutee performed. But the tutee's behavior in the first part of the lesson (success or failure) did disproportionately influence perception of overall performance.

Learning

The item asking, "Overall, how much did the student learn?" resulted in attributions largely contradicting results of questions on performance. Although there was again no effect for the time separation manipulation, second-half performance was a greater determinant overall of the attribution of learning than first-part performance. The main effects were significant for both first-part performance (F = 13.07, $p < .001$) and second-half performance (F = 41.40, $p < .001$), but second-half performance accounted for almost three times as much variance (29%) as first-part performance (11%). A significant interaction also was found between first- and second-part performance (F = 11.26, $p < .001$). Examination of the means showed that subjects attributed approximately the same amount of learning to tutees who performed well throughout the lesson (success-success) as to those who began poorly and then did well (failure-success). Tutees who performed poorly in the second half were seen as learning less than those who had succeeded in the second half; the lowest attribution of amount learned was in the failure-failure condition. In sum, the results for perception of amount learned indicated a recency effect: behavior in the second part of the lesson was the main determinant of assessment of how much the tutee had learned.

Locus of Causality

One of the questions asked whether the tutee or the tutor was the more important determinant of the performance of the tutee. There was only one significant main effect—for second-part learning ($F = 6.84$, $p < .01$). As shown in the fourth column of Table II.1, tutees who performed well in the second part were seen as more influential than the teacher in determining their success, while performance of tutees who did poorly was blamed more on the tutor. There were also two three-way interactions: a first part x second part x sex interaction ($F = 5.80$, $p < .02$) and a second part x time between lesson parts x sex interaction ($F = 8.33$, $p < .005$). Male subjects saw a variable sequence of performance (success-failure or failure-success) as caused more by the tutor than the tutee. Females viewed the tutee as more responsible for his success in the ascending (failure-success) condition when the lesson parts were contiguous, but they viewed the tutor as more influential in the ascending condition when the lesson parts were separated. Results for this item are complex, and a psychologically meaningful interpretation is not obvious.

Subjects were also asked to identify which of four possible causes was most responsible for the tutee's performance: intelligence of the tutee, amount of effort exerted, difficulty of the lesson, and luck. There was no difference in perceived reason for tutee performance between subjects who were told the lesson parts were contiguous and those who were told the second part was delayed, as measured by chi-square tests performed for each tutee performance sequence. Table II.2 shows the reasons subjects gave in each performance sequence, collapsed over the time separation variable. The frequency of the most important reason for tutee performance varied significantly across conditions ($\chi^2 = 20.20$, $p < .025$). Almost all subjects in the success-success condition (88%) attributed the tutee's success to the effort he put into the task. Most subjects in the success-failure condition (64%) also thought the tutee's performance was due to how hard he tried, but a number also thought it was due to how smart he was (14%) or how hard the lesson was (22%). In the failure-success and failure-failure conditions, most subjects again chose effort as the major determinant of tutee performance (69% and 48%, respectively), but the other choices received some support from subjects in each of these two conditions. It appears from Table II.2 that, overall, most subjects thought the most important determinant of tutee performance was how hard he tried—his effort.

Recall of Performance Sequence

Subjects were asked to state whether the tutee shown on the video tape had performed well throughout the two parts of the lesson, performed poorly in both parts of the lesson, started well and then did poorly, or began poorly and then did well. Subjects' perceptions of performance sequence showed no difference according to whether the two parts of the lesson were contiguous or separated by a period of two days. Table II.3 shows the percentage of subjects in each condition reporting a particular performance sequence, collapsed across the two time conditions. Perceived sequence of performance varied significantly across conditions ($\chi^2 = 139.5$, $p < .001$). Overall,

Table II.2

Most Important Reason Given for Tutee Performance (Percent)

Condition	Tutee's Intelligence	Tutee's Effort	Task Difficulty	Chance	
Success-success	12	88	0	0	(100)
Success-failure	14	64	22	0	(100)
Failure-success	13	69	9	9	(100)
Failure-failure	17	48	13	22	(100)

Table II.3

Subjects' Perceptions of Sequence of Tutee Performance (Percent)

Perceived Condition	Actual Experimental Condition			
	Success-Success	Success-Failure	Failure-Success	Failure-Failure
Success-success	58[a]	14	10	8
Success-failure	12	79[a]	0	0
Failure-success	15	4	71[a]	0
Failure-failure	15	4	19	92[a]
	(100)	(101)	(100)	(100)

[a]Accurate report.

subjects were quite accurate in their report, with most subjects correctly identifying the sequence of performance they actually observed. In the success-failure and failure-success conditions there was some distortion, suggestive of an assimilation tendency. Fourteen percent of the subjects in the success-failure condition recalled that the tutee performed well throughout; 19% of the subjects in the failure-success condition viewed the tutee as doing poorly in both parts. Yet, in both these conditions over 70% of the subjects perceived the actual sequence correctly; distortion of recall occurred for relatively few subjects.

Discussion

It will be recalled that we expected that informing subjects of a temporal separation between parts of the lesson would result in the elimination of the primacy effect in ability attributions. The results yielded no support for this hypothesis, however. There were no systematic differences between the conditions in which the parts were contiguous and those in which there was a two-day separation between lesson parts; in both cases the primacy effect emerged robustly on the items asking how well the tutee performed and how intelligent he was.

The present data suggest that explanations of the primacy effect based upon assimilation processes, distortion of memory, or attention decrement may be inadequate. Most subjects were correctly able to identify in a forced-choice question the particular sequence of performance they had actually been shown without any sort of distortion. Likewise, results on the item asking how much the tutee *learned* argue against a generalized tendency to distort or discount later performance. It will be recalled that there was a *recency* effect on this one particular item. Apparently, subjects are attending to what occurs throughout the experiment.

The locus of causality perceived by subjects for the performance of the tutee was highly specific to condition, with wide variations according to sex of subject, performance sequence, and alleged time between lesson parts. However, results on the item assessing the most important reason for the tutee's success suggest that the tutee's internal motivation is viewed by most subjects as being crucial to his performance. Most subjects identified how hard the tutee tried as the major determinant of his success or failure. This raises the possibility that subjects inferred that changes in performance in the success-failure condition were due to tutees becoming bored and hence not trying as hard, which might result in a primacy effect in ability attribution. It is hard to understand how this explanation would hold for the converse condition (failure-success), however.

Data from this experiment show that the primacy effect in attribution of ability occurred despite the alleged two-day period between first- and second-part performance. At least two reasons may be suggested for this result. It is possible that the assimilation hypothesis, which is after all only a descriptive statement, is inaccurate. Our data showing the relatively accurate assessment of performance suggest a different and somewhat more parsimonious hypothesis: perhaps early behavior is regarded as the most veridical indicator of underlying ability, with later behavior not assimilated to early expectations but simply regarded as less valid evidence

than earlier behavior. Thus, there is no distortion of memory involved; rather, there is differential weighting given to early behavior in the determination of the final attribution of ability. Of course, this is mere speculation on our part.

A second, and perhaps more plausible, hypothesis for explaining the lack of difference between the contiguous and two-day delay conditions assumes that the assimilation hypothesis is correct. The lack of effect may have been caused by an insufficient differentiation between the first and second parts of the lesson. In order for the initial expectation to be broken, it may be necessary to provide subjects with a stronger demonstration of the temporal difference between lesson parts for assimilative tendencies based on initial performance to be overcome. Although all subjects included in the data analysis successfully recalled the alleged time interval between lesson parts, we cannot rule out the possibility that this factor was not sufficiently emphasized. In another experiment (Study III) we tested this last possibility by ensuring that the time differential between lesson parts was made salient to the subjects.

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Study III
On the Importance of First Impressions: Further Research on Attribution of Ability and the Primacy Effect[1]

As tutoring of children by other children increases in frequency and popularity in school settings, it has become critically important to formulate a systematic theoretical understanding of the social and educational processes involved in the tutor-tutee relationship. One important question concerns the way in which the tutor forms attributions of ability about his tutee.

Both reinforcement theory and role theory predict that the relative degrees of success and failure of the tutee will affect the tutor's attributions of ability, with successful students being judged more able and intelligent than unsuccessful ones. Although we confirmed this hypothesis in a recent study (Study I), it was also found that inconsistent performance—tutees started well and then did poorly or performed in the opposite sequence—resulted in the somewhat unexpected finding of a primacy effect. Tutees who were successful in the first half of the lesson and then did poorly were seen as being more capable than those who began poorly and then did well, even though the absolute number of successful responses was identical in both conditions. Thus, attribution of ability was determined primarily by initial performance; later improvement or decrement had little effect.

Since ability is usually considered a stable trait, one explanation for such a primacy effect is that the tutor assimilates later information on ability to make it conform to the set or expectancy of success or failure formed initially (Jones & Goethals, 1971). If this is the case, one way of eliminating the primacy effect would be to cognitively differentiate later performance from early performance. We carried out a study to directly test this proposition (Study II). Subjects observed a two-part lesson between a tutor and a tutee. The tutee performed either consistently well, consistently poorly, started well in the first part and then did poorly in the second part, or did poorly and then well. Some subjects received a manipulation designed to break the two parts of the lesson into discrete behavioral units; they were informed that the second part of the lesson that they were to observe had actually occurred two days following the first part. Although these subjects observed both parts at one sitting, it was expected that such a cognitive differentiation between the two parts of the lesson would tend to eliminate the primacy effect. However, results from the experiment yielded no support for this hypothesis. A primacy effect emerged on items assessing perceptions of the tutee's intelligence and his performance; early success was a more important determinant of subjects' assessments than later performance.

In addition, there emerged some direct evidence against an explanation of the primacy effect based upon assimilation processes. Most subjects were able to identify the particular sequence of performance they had observed without any sort of distortion. Apparently, subjects were closely attending to the tutee's performance throughout the experiment. We would have found distortion of second-part performance—not accurate recall—if subjects were assimilating later performance to an earlier expectation. Results on a question asking how much the tutee *learned* also argue against a generalized tendency to distort

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[1] Portions of this study were presented at the annual convention of the American Educational Research Association, 1973.

all aspects of later performance; on this one particular item, a recency effect occurred. Of course, results for this item must be viewed cautiously since this was the only exception to the pervasive pattern of primacy effects found in the experiment.

The most plausible hypothesis for explaining the lack of elimination of the primacy effect in Study II is that the nature of the differentiation between the first and second parts of the lesson might have been weak or unconvincing. To render the initial expectation inoperative, it may be necessary to produce a stronger differentiation between lesson parts than we produced by informing the subjects of the temporal separation. Although all subjects successfully recalled the time interval supposedly existing between lesson parts, we cannot rule out the possibility that the difference between parts was not made salient. The present experiment tests this possibility by ensuring that the time differentiation between lesson parts is emphasized strongly enough so that the two parts of the lesson are clearly perceived as two discrete segments of behavior.

In the present study, subjects actually observed the second part of the lesson two days after the first part. It was reasonable to assume that the initial anchoring expectation held by the subject would not be applied to second-part performance since the passage of time would produce the perception that the second part of the lesson constituted a discrete behavioral unit. We thought that would enhance the subject's adoption of a new anchor based upon the tutee's performance in the second part of the lesson. It is unlikely that the separate nature of the lesson parts could be made more obvious. In addition, we expected that the simple passage of time would weaken the memory of any performance expectation derived from first-part success, thus increasing the impact of second-part performance. For these reasons, then, it was predicted that after the lapse of a two-day period between lesson parts, the subjects' attributions of ability and performance would not reveal a primacy effect.

Method

Subjects

Subjects were 51 males and 45 females in the fifth and sixth grades. Six of these subjects were omitted from the data analysis for failure to complete the dependent measure.

Procedure

Subjects were told that we were interested in finding the best way to plan tutoring programs in elementary school. They were instructed to watch one tutor-tutee pair on video tape and then to answer some questions about what they saw.

Subjects were shown a 15-minute videotaped sequence of a tutoring lesson with a sixth grader tutoring a third grader. Each teaching sequence began with the older child tutoring the younger child in a method of identifying trapezoids and parallelograms. Following this brief lesson, the tutor was shown administering two sets of exercises to the tutee. The tutee was presented a series of 12 figures in each set of exercises and was asked to identify whether each figure was a trapezoid, a parallelogram, or neither.

Male subjects observed a tape of a male tutor-tutee pair; females viewed a female dyad. Subjects observed the video tape in classrooms in groups of five to eight same-sex children. Previous research has shown that observation of a dyad results in attributions of ability equivalent to those made by actual participants in the situation (Jones, Rock, Shaver, Goethals, & Ward, 1968); thus, the present method of observation has the advantage of greater control and economy with no loss of sensitivity.

Experimental Manipulations

The children in the video tape were actually paid confederates. This made it possible to control the apparent degree and pattern of learning. Experimental manipulations consisted of varying orthogonally the first-part performance (success or failure), second-part performance (success or failure), and amount of elapsed time between the viewing of the first and second parts by the subject (either two days or none).

First-part performance and second-part performance were combined factorially to form the following four sequences; only one sequence was shown to each subject.

1. *Success-success.* In this condition, the tutee performed well in both the first and second sets of exercises. The tutee answered correctly on 75% of the questions and, to provide verisimilitude, erroneously on 25% of the questions. The incorrect answers were randomly interspersed among the correct responses.

2. *Failure-failure*. This condition is converse of the success-success condition; the tutee answered 75% of the questions incorrectly on both sets of exercises.
3. *Failure-success*. In this condition, the tutee performed poorly in the first set of exercises (identical to performance in the first part of the failure-failure condition) and successfully in the second set of exercises (as in the second part of the success-success condition).
4. *Success-failure*. In this condition, the tutee answered correctly 75% of the time in the first set of exercises and incorrectly 75% of the time in the second set. Performance was identical to that in the first part of the success-success and second part of the failure-failure conditions.

The manipulation of the alleged amount of time elapsed between the two parts of the exercises occurred after the subjects had viewed the first part. Some subjects were told that the two parts had actually occurred contiguously; these subjects then viewed the second part. The other subjects were told that the second part occurred two days after the first; these subjects viewed the second part two days later.

Dependent Measures and Method of Analysis

After the subjects had viewed both parts of the lesson, the experimenter administered a number of questions using 7-point Likert scales and some forced-choice questions designed to assess the subjects' perceptions of tutee performance. Subjects were asked to assess how well the tutee did and for attributions of ability and learning. Data from each Likert scale were analyzed in a 2 x 2 x 2 x 2 analysis of variance. The four factors were tutee's performance on the first part of the lesson (success or failure), tutee's performance on the second part of the lesson (success or failure), alleged time between the two parts of the lesson (none or two days), and sex of subject.

Results

Attribution of Ability

Two items asked about subjects' attribution of ability concerning the tutee. One question asked how intelligent the tutee was in general, and the other asked how smart he was on the particular type of lesson he was given. Both items yielded basically equivalent results.

On the item assessing the tutee's intelligence, there was no significant effect for alleged time between lesson parts; i.e., whether the subjects viewed the parts of the lesson together or separated by a two-day period made no difference in their ability attributions. Main effects occurred for first-part performance ($F = 18.61$, $p < .001$) and for second part performance ($F = 5.28$, $p < .02$). There was also a significant time between lesson parts x sex interaction ($F = 6.31$, $p < .01$). Male subjects rated the tutee as more intelligent when the two parts of the lesson were viewed together than when they were separated by two days; female subjects showed the opposite pattern.

Examination of overall mean scores in column 1 of Table III.1 shows that for both first- and second-half performance, tutees were viewed as being more intelligent when they performed well than when they performed poorly. However, from the estimates of the *strengths* of the main effects, calculated using Hays' (1963) formula, it is clear that performance in the first part of the lesson accounted for a much greater amount of variance than second-part performance (16% and 4%, respectively). Thus, there was a primacy effect for ability attributions: first-part success or failure was more influential in determining the final attribution than second-part success or failure. The lack of a main effect for the time between lesson parts indicates that the primacy effect occurred even when some subjects saw the second part of the lesson two days after the first part.

On the item asking how smart the tutee was in these particular types of exercises, there was, again, no effect for time between lesson parts. (These data are shown in the second column of Table III.1.) However, main effects were found for first-part performance ($F = 35.74$, $p < .001$) and for second-part performance ($F = 6.57$, $p < .01$). As on the previous item, good performance led to attributions of greater intelligence in the exercises, but first-part performance was more influential (accounting for 27% of the variance) than second-part performance (accounting for only 5% of the variance). Thus, the primacy effect was manifested again. A significant first-part performance x sex interaction was also found ($F = 5.87$, $p < .02$); the difference between good and poor performance in the first part of the lesson was somewhat more marked for male than for female subjects.

Table III.1

Mean Scores for Perception of Tutee Performance

Condition		Tutee[b] How Smart on This Exercise: Intelligence	Overall Performance	How Much Learned	Locus of Causality[c]	How Well Tutor Did[b]
Success-success	(26)[a]	5.42	5.19	5.92	5.73	3.73	6.27
Success-failure	(23)[a]	5.00	4.87	4.91	5.30	4.04	6.48
Failure-success	(22)[a]	4.64	4.18	3.95	5.5[illegible]	4.37	5.91
Failure-failure	(25)[a]	4.16	3.40	3.52	4.68	3.84	5.56
First-half success		5.22	5.04	5.45	5.53	3.88	6.37
First-half failure		4.38	3.77	3.72	5.06	4.09	5.72
Second-half success		5.06	4.73	5.02	5.62	4.02	6.11
Second-half failure		4.56	4.10	4.19	4.98	3.94	6.00

[a]Number of subjects in individual cells.
[b]Higher numbers indicate more positive responses on a 7-point scale.
[c]Higher numbers indicate locus is toward tutee.

Thus, both items assessing attribution of ability yield essentially the same result—a primacy effect. Separating the lesson parts had no significant effect on the primacy phenomenon; even when the second part of the exercise was viewed two days after the first part, performance in the first part determined the attributions made about the tutee.

Perception of Performance

Subjects were asked to complete an item asking how well the tutee had done. Results of an analysis of variance showed main effects for first-part performance ($F = 58.73$, $p < .001$) and for second-part performance ($F = 10.43$, $p < .002$). There was also time between lesson parts x sex interaction ($F = 4.57$, $p < .04$); male subjects recalled more successful performance when the lesson parts were contiguous than when they were separated while females showed the opposite pattern.

Examination of the means in column 3 of Table III.1 shows that successful performance tended to engender perceptions of better performance than unsuccessful performance. But estimates of the strengths of the two main effects showed that first-part performance was much more influential, accounting for 38% of the variance, while second-part performance accounting for [illegible] of the variance in determining subjects' perceptions of how well the tutee performed. Thus, a primacy effect emerged in subjects' overall assessments of tutee performance.

Learning

One item assessed how much the tutee learned overall. As in the previous items, the main effect for time between lesson parts was not significant. The main effect for second-part performance was significant ($F = 5.11$, $p < .03$), while the effect for first-part performance was not significant. Overall, subjects viewed tutees who performed well in the second part as having learned more than those who performed poorly, with first-part performance having little effect (column 4 of Table III.1). For this particular item, then, there was a recency effect, corroborating the results for this item in Study II.

Significant interactions also appeared on the question asking how much the tutee had learned overall. A time between lesson parts x sex interaction ($F = 9.94$, $p < .002$) indicated that male subjects thought the tutee learned more when the lesson parts were contiguous than when they were separated, but the pattern was reversed for females. A second-part performance x time between lesson parts x sex interaction ($F = 3.81$, $p < .05$) was also found. Male subjects who viewed the two parts of the lesson together rated subjects who performed well in the second part as learning slightly less than those subjects who performed poorly in the second part. For subjects

Table III.2

Most Important Reason Given for Tutee Performance (Percent)

Condition	Tutee's Intelligence	Tutee's Effort	Task Difficulty	Chance	
Success-success	19	77	4	0	(100)
Success-failure	22	70	9	0	(101)
Failure-success	14	59	27	0	(100)
Failure-failure	8	76	8	8	(100)
Mean across conditions	16	71	12	2	(101)

in other conditions this relationship was reversed, as would be expected.

Overall, then, there was a *recency* effect for subjects' assessments of how much the tutee learned; performance on the second part of the lesson primarily determined the subjects' ratings of the amount the tutee learned.

Locus of Causality

On the item asking whether the locus of causality for the tutee's success resided in the tutor or tutee, the only significant effect was on the interaction of first-part performance x second-part performance x sex (F = 5.32, $p < .02$). Male subjects attributed consistent performance (success-success or failure-failure) more to the tutor's behavior and inconsistent performance (success-failure and failure-success) to the tutee, while female subjects showed the opposite trend. Mean scores for this item are in column 5 of Table III.1.

One question attempted to assess what subjects considered to be the most important reason for the tutee's performance. Subjects were asked to decide which of four factors (how smart the tutee was, how hard he tried, the difficulty of the exercises, or luck) was the predominant cause of the tutee's success. Chi-square tests showed that there was no difference in the distribution of the reasons cited between subjects who viewed the lesson parts together or with a two-day interval. Likewise, a chi-square test showed that the distribution of reasons did not differ significantly across the four sequences of tutee performance (χ^2 = 14.63, $p < .20$). As can be seen in Table III.2, most subjects (71%) felt that the tutee's effort was the most important reason for his success. A much smaller number (16%) felt that the intelligence of the tutee was the major determinant of his performance, while 12% of the subjects thought task difficulty was most important. Only 2% of the subjects cited luck as the major reason for tutee success.

Tutor Success

Subjects were asked to assess how well the tutor did as a teacher. Only one significant main effect emerged—for first-part performance (F = 6.51, $p < .01$). In conditions where the tutee performed well in the first part of the lesson exercises, the tutor was seen as doing well; when the tutee performed poorly in the first part, the tutor was seen as doing poorly (Table III.1, column 6). Subsequent success or failure in the second part of the lesson did not have a significant effect on the subject's attribution of tutor success, and there was no effect due to separating the lesson parts by two days. We thus find a primacy effect in attributions of ability regarding *tutor* success or failure that is equivalent to the primacy effect in attributions regarding the *tutee*.

Recall of Performance Sequence

Another question was designed to obtain the subjects' specific impressions of the sequence of tutee performance. Subjects were asked to indicate whether the tutee had performed well throughout, performed poorly throughout, started well and then did poorly, or started poorly and then did well. On this item there was no difference due to separating the lesson parts. A significant difference was found in perceived condition according to the

subjects' actual experimental condition (χ^2 = 128.35, $p < .01$). As can be seen in Table III.3, most subjects correctly identified the sequence they actually observed. The subjects viewing the success-success sequence of tutee performance were the most accurate; 86% of the subjects were correct. Subjects in the failure-success condition were also fairly accurate; 82% were correct. Most subjects in the success-failure condition (69%) were correct, although 13% of the subjects thought they had viewed a sequence in which the tutee had performed well in both parts. This is a distortion suggesting a primacy effect. In the failure-failure condition, 56% of the subjects were correct, while 20% felt the tutee had performed in a success-success sequence and another 20% thought he had performed in a failure-success sequence. Taken as a whole, though, results on this question seem to indicate that subjects were fairly accurate in their assessment of the sequence of tutee performance.

Discussion

It was hypothesized that breaking a lesson into two discrete units would eliminate the primacy effect usually found in ability attributions. We separated the first half of the lesson from the second by two days. Although there were some second- and third-order interactions relating to the time separation, there were no systematic results indicating an elimination of the primacy effect. Attributions of ability were mainly determined by performance—success or failure—in the first part of the lesson; performance in the second part had little influence on observers' attributions. Rating of overall performance, like ability attribution, was not affected by the two-day period between lesson parts. Perception of how well the tutee performed was due primarily to first-part success, with subsequent performance having a much smaller influence.

The present data do not provide support for our hypothesis that a temporal differentiation between two parts of a lesson will eliminate the primacy effect. On grounds of memory factors alone, one might have expected that these youthful (sixth-grade) subjects would not recall first-part performance as well as second-part performance, thus attenuating the primacy effect. Yet, this was not the case; initial performance emerged as the predominant determinant of subjects' responses in spite of the two-day period between early and later performance. Perhaps we did not differentiate the first- and second-part performances sufficiently to eliminate the primacy effect. This seems rather unlikely, however, since subjects observed the second-part behavior after the lapse of two days. It is also possible, of course, that two days is too small a period of time to produce a clear cognitive differentiation. If the amount of time between initial and later performance were increased, the likelihood of a primacy effect occurring would undoubtedly eventually decrease.

Some of our data suggest that assimilation may not be an adequate mechanism to explain the primacy effect in the present experiment. First, subjects did not display a generalized primacy effect, as would be expected if recall of performance were assimilated toward initial expectation. Rather, subjects appeared to be highly discriminating in responding to the various items on the dependent measure. On the item concerning the amount the tutee learned during the lesson, a recency effect was obtained. Subjects perceived that more learning had occurred when the tutee succeeded in the second part than when he performed poorly in the second part; there was no differential effect of perceived learning due to the tutee's first-part performance. Since this result was also found in an earlier study (Study II), it does not seem to be a mere chance occurrence.

There is more direct evidence that questions the assimilation explanation of the primacy effect in the present study. On the question asking for subjects' perceptions of the pattern of tutee performance, little distortion was found. Most subjects were able to recall the precise sequence of the tutee's success and failure. We would not expect such accurate recall if subjects were distorting second-part performance to conform to an expectation formed earlier. It is noticeable that when distortion of recall did occur (Table III.3), subjects distorted their memory of performance more often in the direction opposite the initial expectation.

Taken together, results on the items concerning degree of learning and explicit performance sequence cast doubt on the assumption of a generalized tendency to distort second-part performance to conform with first-part expectations. Hence, assimilation may not be a satisfactory explanation for the primacy effect found in the present study.

It is clear that early performance contributes disproportionately to attributions of ability and perceptions of performance. Apparently, individuals apply differential weighting to various portions of performance in forming ability attributions. Yet, this remains merely a descriptive statement. The underlying psychological mechanisms must be discovered in order to understand more satisfactorily the primacy effect.

Table III.3

Subjects' Perceptions of Sequence of Tutee Performance (Percent)

Perceived Condition	Actual Experimental Condition			
	Success-Success	Success-Failure	Failure-Success	Failure-Failure
Success-success	88[a]	13	14	20
Success-failure	4	69[a]	0	4
Failure-success	4	9	82[a]	20
Failure-failure	4	9	4	56[a]
	(100)	(100)	(100)	(100)

[a]Accurate report.

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Study IV
Attribution of Ability: An Unexpected Recency Effect

The finding that early performance is a more influential determinant of attribution of ability than later performance is well-established (Jones & Goethals, 1971). We found, for instance, that sixth-grade tutors made attributions of ability about their tutees which were primarily dependent upon early performance; later performance had only a slight effect on the attribution (Study I). Thus, tutees who were successful in the first half of a lesson and then did poorly were seen as being more capable than those who began poorly and then did well, even though the absolute number of successful responses was identical in both conditions.

The finding of a primacy effect in ability attributions is consistent with earlier work in person perception. Asch (1946) found that subjects given a list of adjectives to describe a person (e.g., intelligent, skillful, industrious, determined, practical, cautious), placed greater emphasis on information earlier in the list than on information that came later. According to Asch's explanation, the primacy effect is caused by subjects' modifying the actual meaning of the words at the end of the list to conform to a Gestalt formed from the initial adjectives. More recent work in information processing (Anderson, 1965) has led to a somewhat different explanation. Anderson contends that the actual meanings of the words remain unchanged throughout a series. But differential weighting is given to the words according to their position in a list; earlier words are given greater weight than those appearing later. However, the hypotheses of both Asch (1946) and Anderson (1965) are basically descriptions and do not fully explain the psychological processes involved in the primacy effect in ability attributions. The research of Asch and Anderson also differs in a significant way from research on ability attribution. In the personality impression studies, traits are varied along many discrete dimensions; in contrast, research on ability attribution has been concerned only with the unidimensional trait of ability.

The most satisfactory explanation for the primacy effect in ability attribution has been suggested by Jones, Goethals, Kennington and Severance (1972). They argue that in the case of attributions of stable traits such as ability, early performance sets up an initial expectation or anchor to which later changes in performance are assimilated. Assimilation presumably occurs through a process of memory distortion; later performance is recalled as more consistent with early performance than is objectively true.

If assimilation is the process through which later performance is distorted, then one way of eliminating the primacy effect is to ensure that individuals can accurately recall the pattern of performance. Preventing the development of an early expectation and distortion in memory of later performance should eliminate the primacy effect. Different patterns of performance should result in equivalent ability attributions as long as the absolute degree of success is identical. Thus, given an equal amount of success overall, an ascending performance pattern should be judged as indicative of the same underlying ability as a descending performance pattern.

Experiment 1

The first experiment tests the hypothesis that an individual's awareness of actual performance (without the possibility of memory distortion) will eliminate the primacy effect in attribution of ability. In this experiment

subjects were shown a graphical chart of the sequence of a person's performance on a series of items from a concept-formation task. Since the complete performance sequence was explicitly provided, there was no possibility for the occurrence of assimilation through memory distortion of later performance. Given these conditions, it was predicted that the primacy effect in ability attribution would be eliminated and that, instead, the subject's judgment would not be influenced by sequence of the observed performance.

Method

Subjects

Subjects were 46 male and 32 female undergraduates enrolled in an introductory psychology class. They received class credit for participation. All subjects completed the questionnaire together at a single sitting in a classroom.

Procedure

The instructions on the short questionnaire that subjects received stated that they would be seeing a chart showing the performance of a third-grade tutee who was tested on identification of the concept of trapezoid by his fifth-grade tutor. The chart showed whether the tutee answered correctly or incorrectly on each of the 28 items of the test. It was made clear to subjects that trapezoid identification is an appropriate task for a third grader and that the tutor had done an adequate job in teaching the concept. It was also stressed that each of the items in the test was of equal difficulty.

Each subject was shown one of four charts of the tutee's performance (Figure IV.1). The sequence and number of correct answers on the test were experimentally manipulated to form the following four experimental conditions:

1. *Success-success*. In this condition, the tutee was successful throughout the test. On both the first and second halves of the test the tutee answered 11 out of the 14 items correctly. For purposes of verisimilitude, six of the 28 answers were erroneous responses; these were interspersed throughout the test.
2. *Failure-failure*. This condition was the converse of the success-success condition. The tutee answered 22 out of 28 items incorrectly; only six items, interspersed throughout the test, were correct responses.
3. *Failure-success*. In this condition, the tutee did poorly in the first half of the test and well in the second half. The performance sequence was identical to that in the first half of the failure-failure condition and the second half of the success-success condition.
4. *Success-failure*. In this condition, the tutee did well in the first half of the test and poorly in the second half of the test. The performance sequence was identical to that in the first half of the success-success condition and the last half of the failure-failure condition.

Dependent Measures and Method of Analysis

Subjects were asked to complete two questions with 7-point Likert scales regarding the tutee's performance: (1) "How well did the student do?" and (2) "How intelligent is the child on this kind of exercise?" Data from the two Likert scales were analyzed using a 2 x 2 x 2 analysis of variance. The three orthogonal factors were first-half performance on the test (success or failure), second-half performance (success or failure), and sex of subject. Subjects could refer to the chart of the tutee's performance which appeared on the previous page of the questionnaire while completing the two Likert scales. Subjects also were asked in an open-ended question to describe the reason for the tutee's success.

Results

Analysis of variance on the item, "How well did the student do?" disclosed main effects for both first-half performance ($F = 18.13$, $p < .001$) and second-half performance ($F = 47.52$, $p < .001$). As shown in the first column of Table IV.1, tutees were seen as doing better when they made more correct responses in the first half of the exercises than when they did poorly; likewise, tutees were perceived as more successful when they appeared to do well in the second half than when they did poorly. However, Hays' (1963) procedure for determining the strength of an experimental effect showed that second-half performance accounted for more variance (48%) than first-half performance (18%). Thus, there was a

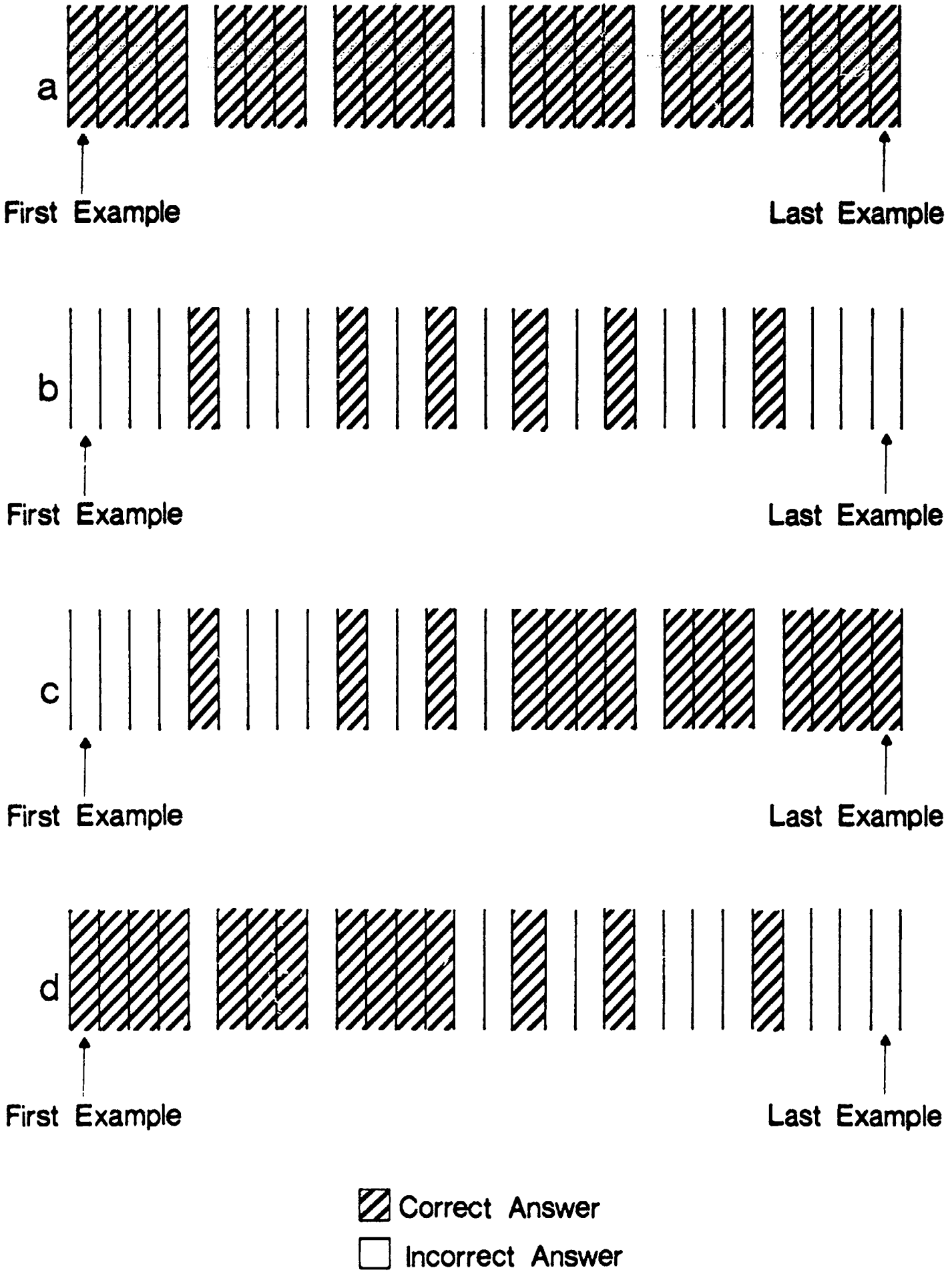

Figure IV.1. Graphical representation of tutee performance—Experiment 1. a. success-success condition; b. failure-failure condition; c. failure-success condition; and d. success-failure condition.

Table IV.1

Mean Scores for Perception of Tutee Performance—Experiment 1[a]

Condition[b]		How Well Tutee Did	How Intelligent Tutee Is
Success-success	(14)	5.57	5.07
Success-failure	(25)	3.92	4.12
Failure-success	(20)	4.55	4.60
Failure-failure	(19)	2.84	3.16
First-half success		4.51	4.46
First-half failure		3.71	3.89
Second-half success		4.97	4.79
Second-half failure		3.45	3.70

[a] Higher number indicates more positive responses on a 7-point scale.
[b] Numbers in parentheses indicate number of subjects in individual cells.

recency effect: second-half performance was more influential than first-half performance in determining subjects' assessments of how well the tutee had performed.

A significant main effect for sex of subject was also found on the item assessing how well the tutee had performed ($F = 5.09$, $p < .03$). Female subjects tended to give more positive ratings to the tutee than male subjects did. No significant interactions were found.

Results for the item asking for subjects' attributions of ability on the lesson ("How intelligent is the student on this kind of exercise?") revealed the same pattern as on the previous item. There were main effects for first-half performance ($F = 11.93$, $p < .001$), for second-half performance ($F = 32.46$, $p < .001$), and for sex of subject ($F = 6.70$, $p < .01$). No interactions were significant. Examination of the means (column 2 of Table IV.1) shows that successful performance in the first half resulted in more positive attributions than prior first-half performance and that successful second-half performance led to greater attributions of intelligence than unsuccessful second-half performance. The significant main effect for sex was caused by female subjects giving higher ratings than male subjects on intelligence of the tutee.

As on the previous item, subjects' second-half performance was more important than first-half performance in determining the attribution of intelligence made about the tutee. Estimates of the strengths of the main effects (Hays, 1963) showed that second-part performance accounted for 32% of the variance and first-part performance accounted for 12% of the variance. Thus, there was again a clear recency effect in the ability attributions.

Open-ended responses to the question asking, "Can you think of any reasons for the student's performance?" were content analyzed. Responses were coded into five categories of causes for the tutee's performance: the tutor's adequacy, attentional and motivational factors, tutee's ability and understanding, tutee's confidence or anxiety, and other factors. Table IV.2 shows the percentage of responses given for each category according to condition. A chi-square test showed that the reasons cited for the cause of tutee performance did not differ significantly according to condition ($\chi^2 = 15.43$, $p < .25$). Most subjects felt that tutee performance was caused either by attentional or motivational factors (32%) or the tutee's underlying ability or understanding (34%). Only 12% of the subjects thought performance was caused by the tutor's behavior; 7% thought that the tutee's confidence or anxiety was important. Fifteen percent of the subjects cited some other factor as being critical to the tutee's performance.

Discussion

It was expected that providing subjects with a complete record of an individual's performance over time, thereby preventing memory distortion, would eliminate the primacy effect usually found in research on attribution of ability. The hypothesis was confirmed:

Table IV.2

Reasons Given for Tutee Performance by Condition (Percent)—Experiment 1

Reason	Condition				Total Across Conditions
	Success-Success	Success-Failure	Failure-Success	Failure-Failure	
Tutor attributes	15	9	7	18	12
Attention or motivation of tutee	25	43	22	29	32
Ability or understanding of tutee	30	34	37	32	34
Confidence or anxiety of tutee	0	2	15	12	7
Other	30	12	19	9	15
Total	(100)	(100)	(100)	(100)	(100)

first-part performance was less influential than second-part performance in determining subsequent ability attribution. Thus, instead of a primacy effect, a recency effect was obtained.

Although elimination of the primacy effect was predicted, the strength of the second-half performance main effect was somewhat surprising. On both dependent measures (how well the tutee performed, and how intelligent he was), second-half performance accounted for twice as much variance as first-half performance. If first- and second-half performance had contributed equally in determining ability attribution, the strengths of the two main effects should have been approximately the same. It thus appears that when memory factors are eliminated, a recency effect results.

Still, we viewed the finding of a recency effect quite cautiously until a replication study was conducted. We thought the results might have been due to some idiosyncrasy of the particular performance patterns or the description of the situation given to subjects. Since the recency effect was unexpected, a second experiment was conducted in an attempt to replicate the findings of Experiment 1.

Experiment 2

The second experiment was designed to [illegible] Study I. In that study, sixth-grade tutors actually taught third-grade tutees; the tutees were confederates who performed in a prescribed sequence of successes and failures. In the original study, a strong primacy effect in ability attributions was found. In the present experiment, a careful description of the situation of the original study was given to subjects. Subjects then viewed a graphical representation of one of the exact sequences of performance displayed by a tutee in the earlier study, thus allowing a direct comparison between results of the present experiment and those of Study I. It was expected, as in Experiment 1, that the primacy effect in attributions of ability would not occur when the entire performance sequence was made available to the subjects.

Method

Subjects

Subjects were 115 males enrolled in an introductory psychology class. Each subject received class credit for completing the questionnaire. All questionnaires were answered at the same time in a large classroom.

Procedure

As in Experiment 1, subjects received a brief questionnaire. The instructions attempted to reconstruct as closely as possible the ex-

perimental situation in which a sixth-grade tutor actually taught a third-grade tutee (Study I). Instructions were as follows:

> We are interested in getting your reactions to the results of a tutoring session in which a fifth-grade child tutored a third grader on how to identify a trapezoid. It was known that identification of trapezoids is appropriate for third graders—neither too hard nor too easy for the child to learn.
>
> On the following page is a chart of the younger child's performance on a set of exercises which were given to him immediately following an adequate 10-minute teaching session. During the exercises, the younger child was shown a series of figures and asked whether or not each figure was a trapezoid. Each of the figures in the exercises was of equal difficulty. The following chart shows which examples the third grader answered correctly and which he answered incorrectly. The chart, of course, reads from left to right, with the first example in the exercises on the left and the last example in the exercises on the right.
>
> You will note that the halfway point in the exercises is marked with an arrow. At this point the fifth-grade tutor briefly reviewed the rules of trapezoid identification for the third grader.
>
> Please look at the chart carefully. After looking at the chart, answer the questions that follow it.

Following the description of the tutoring session, each subject was shown one of four charts of tutee performance (Figure IV.2). The four patterns of correct and incorrect responses were identical to those displayed by the tutee (confederate) in Study I. The charts showed the following four experimental conditions:

1. *Success-success*. The tutee performed well on both the first and second halves of the test. He answered 9 out of 12 items correctly on each half of the 24-item test. To provide verisimilitude, the tutee answered incorrectly on six items interspersed throughout the test.
2. *Failure-failure*. In this condition, the tutee did poorly on both halves of the lesson. He answered 15 out of 24 examples incorrectly. This condition was the converse of the success-success condition.
3. *Failure-success*. In this condition, the tutee did poorly in the first half of the lesson (identical performance in the first half of the failure-failure condition) and well in the second half (as in the last half of the success-success condition).
4. *Success-failure*. In this condition, the tutee's responses were the same as those in the first half of the success-success condition and the second half of the failure-failure condition.

The four sequences were equivalent to the four conditions used in Experiment 1. But because of the arrow indicating the halfway point in the exercises (at which time the tutor supposedly reviewed the rules of trapezoid identification), any difference in success between the first and second halves of the lesson was made more conspicuous than in the earlier experiment. The graphical representations also differed from those in Experiment 1 in that there were four fewer trials in this experiment.

Dependent Measures and Method of Analysis

Subjects were asked to complete two 7-point Likert scales regarding the tutee's performance: "How well did the student do?" and "How intelligent is the student on this kind of exercise?" The Likert-scale items were analyzed by analysis of variance. There were two orthogonal factors: tutee's performance on the first part of the lesson (success or failure) and his performance on the second part of the lesson (success or failure). Subjects also were asked to respond to an open-ended question asking the reason for the tutee's performance.

Results

On the item asking how well the tutee had performed, the only significant effect in the analysis of variance was for second-half performance ($F = 39.15$, $p < .001$). First-half performance did not approach significance, and the interaction also was not significant. Examination of the means shown in Table IV.3 reveals that tutees who succeeded in the second half of the lesson were seen as performing much better than those who performed poorly in the second half. First-half performance had little effect on subjects' assessments of performance.

The question asking about intelligence

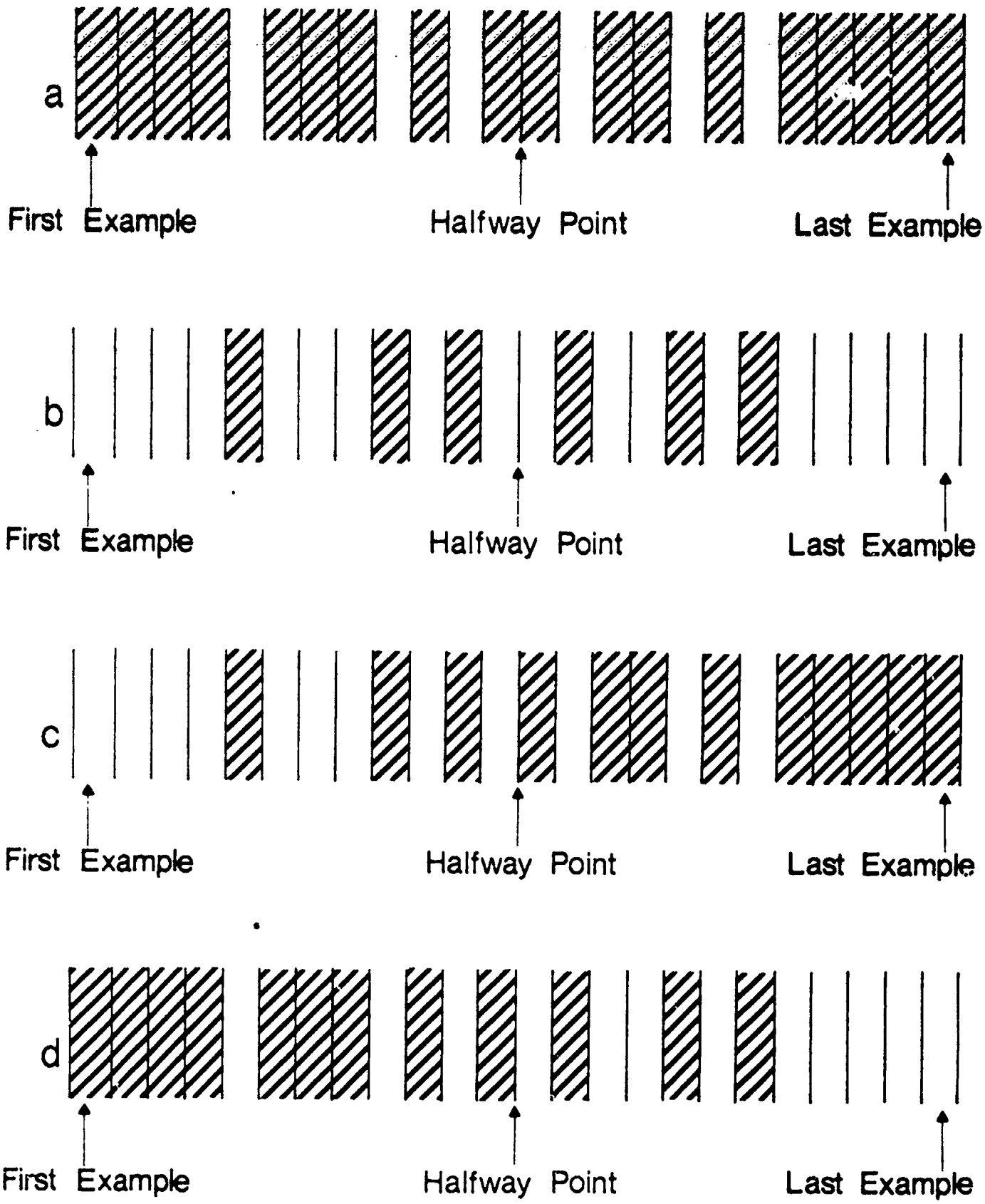

Figure IV.2. Graphical representation of tutee performance—Experiment 2.

a. success-success condition; b. failure-failure condition;
c. failure-success condition; and d. success-failure condition.

Table IV.3

Mean Scores for Perception of Tutee Performance—Experiment 2[a]

Condition[b]		How Well Tutee Did	How Intelligent Tutee Is
Success-success	(32)	4.72	4.41
Success-failure	(28)	3.61	3.93
Failure-success	(27)	4.93	4.89
Failure-failure	(28)	3.18	3.57
First-half success		4.20	4.18
First-half failure		4.03	4.21
Second-half success		4.81	4.62
Second-half failure		3.39	3.75

[a] Higher numbers indicate more positive responses on a 7-point scale.
[b] Numbers in parentheses indicate number of subjects in individual cells.

Table IV.4

Reasons Given for Tutee Performance by Condition (Percent)—Experiment 2

	Condition			
	Success-Success	Success-Failure	Failure-Success	Failure-Failure
Tutor attributes	18	13	20	29
Attention or motivation of tutee	16	39	8	22
Ability or understanding of tutee	20	34	41	20
Confidence or anxiety of tutee	7	6	8	0
Other	39	8	23	29
Total	(100)	(100)	(100)	(100)

of the tutee revealed a significant main effect for second-half performance ($F = 17.00$, $p < .001$). The first-half performance effect again was not significant. There was a significant interaction between first- and second-half performance ($F = 3.86$, $p < .06$). Again, second-half performance was the main determinant of attributions of intelligence; first-half performance had little effect (Table IV.3). Interestingly, the significant interaction was caused by subjects' judging tutees in the failure-success condition as being even more intelligent than tutees in the success-success condition. Overall, a strong recency effect was found on both items concerning perceptions of tutee performance; these results are consistent with the data from Experiment 1.

A content analysis of subjects' explanations for the tutee's performance showed that the reasons given depended upon the tutee's amount and pattern of success ($\chi^2 = 21.62$, $p < .05$). Table IV.4 presents the reasons cited by subjects in each of the four conditions. The tutor's behavior was the reason cited most often for the tutee's performance in the failure-failure condition; consistent poor performance was thought to be more a function of the tutor than in other conditions.

In the success-success condition, however, the tutee's ability and understanding was cited as the most important determinant of performance. In the success-failure condition, attention and motivation were the most frequent explanations of tutee performance; most subjects thought that the tutee had either stopped trying or had grown bored by the second half of the lesson. In the converse sequence (failure-success), most subjects thought that tutee's ability or understanding was responsible for his performance.

Discussion

In Experiment 2, a strong recency effect was found both for attribution of ability and for perception of performance. No significant primacy effect was disclosed. Thus, the results were consistent with the direction of findings in Experiment 1. The weak effect for early performance found in Experiment 1 did not appear at all in Experiment 2, and a recency effect even stronger than observed in Experiment 1 was revealed. Subjects' judgments were influenced by how well the tutee did in the last part of the lesson, but performance in the first part had little impact on their judgments. Our data very strongly indicate that under conditions of the present experiments, the primacy effect normally found in attribution of ability is eliminated and a strong recency effect occurs instead.

In Experiment 2, an attempt was made to replicate conceptually an earlier study (Study I) in which a strong primacy effect was found by describing the procedure of that experiment precisely and completely to the subject. Study I and the present experiment differed most importantly, of course, in that subjects actually served as tutors in the earlier study but only observed the tutee's performance in the present study. Actual participation as a tutor in the lesson should not be crucial to the production of the primacy effect, however, since the primacy effect was found when subjects merely watched a video-taped film of a tutoring session (Jones et al., 1972).

It would seem that the critical difference between the present two experiments and earlier studies that obtained a primacy effect resides in the clear accessibility to subjects of the entire sequence of the tutee's performance. When a person observes another's performance on a trial-by-trial basis, by the end of the sequence recollection of the performer's behavior may not be entirely accurate. Jones et al. (1972) suggest that under such conditions the memory of the learner's performance at later stages may be distorted and assimilated toward the expectation established by the initial performance. In observing a learner's performance trial by trial, the subject may engage in a complex information-processing operation of constantly checking the performance on each trial against earlier behavior, attempting to remember the pattern of performance up to that point in time, and testing tentative hypotheses about the performer's underlying ability.

By contrast, in the present studies the entire sequence of the performer's behavior from beginning to end of the learning session was available for the subject to inspect at any given point in time. This procedure differs in two ways from the trial-by-trial observation characteristic of studies that have obtained a primacy effect. First, as we discussed earlier, accessibility of the total pattern of the learner's behavior prevents the usual distortion of memory that Jones et al. (1972) hypothesize is responsible for the primacy effect. Second, the subject is not forced to engage in information processing and hypotheses testing on a trial-by-trial basis. An initial expectation should be established only when one observes the learner on a sequential basis. It thus appears that there are two processes responsible for the primacy effect: establishment of an initial expectation and memory distortion of later performance. It is reasonable to believe that both processes are eliminated when the subject is shown the learner's entire performance sequence at a single time.

From the above analysis, it is clear why we did not obtain a primacy effect. But why was a recency effect found in the present two experiments? We suggest that when complete information about a learner's performance is available, the subject tends to assume that the last phase of performance is most indicative of the degree of mastery of the material and of the learner's underlying ability. Thus, when shown an entire sequence of performance observers in the present experiment chose latest performance as most representative of the stimulus person's success.

The present findings should reduce concern about the real-life implications of the primacy effect found in attributions of ability. According to present data, a primacy effect will not appear if the cumulative record of a person's performance is available. Our data indicate that when the entire sequence of performance is present, the attribution of ability is more strongly affected by most recent performance than earlier performance. Certainly, then, under such conditions the fear of biased effects from forming first impressions based on early performance is not as serious a problem as earlier findings suggest.

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